

REMARKS**Introductory comments:**

Claims 1-22 are pending in the application. The Applicant respectfully requests reconsideration of claims 1-5, 9-13 and 17-22. Claims 6-8 and 14-16 have been cancelled.

In response to the Drawing objections:

In response to the drawing objection set forth in paragraphs 1-3 of the Office Action dated January 7, 2003, one sheet of substitute drawings has been submitted herewith containing Figs. 1, 2, 3, and 4. In the substitute drawings, the reference numerals 39 and 41 have been added to clarify the description set forth in paragraph [0030] of the specification. No new matter has been added.

In regard to paragraph 1 of the Office Action, the electrically wound magnetic core 30, which is illustrated in Figure 3 has been further illustrated in Figure 2. The magnetic core 30 is illustrated as a plurality of electro-magnets as are common in stepper motors. This feature is both shown in the drawings at Figure 3 and is supported by the specification at paragraph [0026]. Applicant will formalize the drawing changes upon the Examiner's approval.

In regard to paragraph 2 of the Office Action, the electrically wound magnetic core has been further illustrated in Figure 2, and the coupling of the leaves to the rotor and stator have also been further illustrated therein. The rotor 32 is coupled to the diaphragm 16 at pins 39 and stator 28 at pin 41. This feature is both shown in Figure 3 and is supported by the specification at paragraph [0030]. Applicant will formalize the drawing changes upon the Examiner's approval.

In regard to paragraph 3 of the Office Action, the reference sign mentioned in the description has been added thereon. Applicant will formalize this change upon the Examiner's approval.

In response to the Specification objections:

In regards to paragraph 4 of the Office Action, Applicant has amended page 9, paragraph [0029] to clarify that "The electrically wound magnetic core 30 includes a plurality of electro-magnets." Additionally, on page 10, paragraph [0030], the rotor is described as a "plurality of permanent magnets 31 (second magnetic core)." The stator includes the first magnetic core, as in claim 9, line 3, and the rotor is the second magnetic core, as in claim 9, line 12, as is typical of stepper motors. Therefore, Applicant has defined "magnetic core" to include a "plurality of permanent magnets." This is intended to clarify the structure that comprises the claimed magnetic core. This change is supported by the original description, which includes a stepper motor embodiment. (See page 9, paragraph [0026], lines 4-5). Stepper motors are characterized by a magnetic core comprising a plurality of electro-magnets. Thus, the claims and description, including the drawings, have been made commensurate in scope as the claims correspond to the electrically wound magnetic core described in the specification.

Also in regards to paragraph 4 of the Office Action, Applicant has amended page 10, paragraph [0030], to state that, "The pivot pins 38 are ideally placed such that a first pin 39 on each leaf attaches to the rotor 32 and a second pin 41 on the alternate side of at least one of the leaves attaches to the stator assembly frame 34, as will be understood by one skilled in the art." Claim 1 includes the limitation in lines 11-15, "a first portion of at least one of said plurality of diaphragm leaves coupled to said stator, a second portion of another of said plurality of diaphragm leaves coupled to said rotor." Applicant therefore amends the

Detailed Description to correspond with Claim 1 and therefore clarifies how the blades are coupled to the stator and rotor. Claim 1 includes embodiments where only one pin from one of the leaves or one first portion of the leaves is coupled to the stator, whereas a second portion or pin from another leaf is coupled to the rotor. Therefore, Claim 1 includes embodiments where one or more pins are coupled to the rotor and one or more pins are coupled to the stator.

In response to the Claim objections:

Claims 6-8 and 14-16 have been cancelled.

In response to the Claim rejections:

Claims 1-5, 9-13 and 17-22 are rejected under 35 U.S.C. §102(b) as being anticipated by *Devenyi* et al. (US Patent 5,955,806). According to the Office Action, *Devenyi* discloses a torque motor having an annular cylindrically symmetric stator and rotor. The stator includes a frame and multiple magnets mounted thereon. The rotor is rotatably coupled to the annular magnet member and defines a channel. Also according to the Office Action, a diaphragm is coupled to the stator via a pin and to the rotor via a pin. The diaphragm includes leaves pivotally arranged to form an adjustable aperture.

The Applicant respectfully submits that claims 1, 9 and 17 are novel and non-obvious because the claims and the prior art differ. The system in *Devenyi* is conventional in that the "driver pins 65 extend axially from the support base 30 and pass through slots 66 in the end of the rotor ring." (column 3, lines 52-59). *Devenyi* does not disclose that the pins are part of the diaphragm as is claimed in claims 1, 9, and 17. *Devenyi* does not disclose or suggest an embodiment including diaphragm pins.

The structure of the diaphragm including the pins described by the Applicant is advantageous in that it facilitates assembly, and reduces costs because the task of aligning the diaphragm pins with slots on the rotor and stator is simplified.

Additionally, the claimed configuration has improved range of motion over the prior art due to the pivot pin arrangement. In other words, the motor as disclosed in *Devenyi* having the pin arrangement, illustrated in Figure 6, does not have the improved range of motion resulting from the claimed structure.

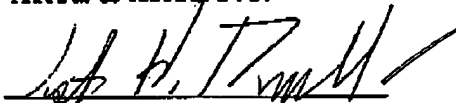
Claims 1, 9 and 17 are novel in view of the cited prior art. For at least the same reasons, dependent claims 4, 5, 10-13, and 8-22 are also novel and non-obvious.

In view of the aforementioned remarks, it is respectfully submitted that all pending claims are in a condition for allowance. A notice of allowability is therefore respectfully solicited. Please charge any fees required in the filing of this amendment to Deposit Account 50-0476.

The Examiner is invited to contact the undersigned at (248) 223-9500 if any unresolved matters remain.

Respectfully Submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Drawings:

Please substitute the one sheet of drawings submitted herewith containing Figures 1, 2, 3, and 4 in place of the originally filed drawing sheet containing the same figures.

In the Detailed Description:

Please amend paragraph [0029] on page 9 as follows:

[0029] (Amended) The electrically wound magnetic core 30 is illustrated as coupled to the sidewall 42 in FIGURE 3, however, FIGURE 4 illustrates the electrically wound magnetic core 30 coupled to the second annular element 44. One skilled in the art will understand that numerous alternate positions of the electrically wound magnetic core 30 are within the scope of the present invention. The electrically wound magnetic core 30 includes a plurality of electro-magnets.

Please amend paragraph [0030] on page 10 as follows:

[0030] (Amended) The rotor 32 is embodied as a second annular member including a second frame 50 coupled to a plurality of permanent magnets 31 (second magnetic core). Both the rotor 32 and stator assembly 28 are rotatably attached to a portion of each of the plurality of diaphragm leaves 18 through pivot pins 38. The pivot pins 38 are ideally placed such that a first pin 39 on each leaf attaches to the rotor 32 and a second pin 41 on the alternate side of [the leaf] at least one of the leaves attaches to the stator

assembly frame 34, as will be understood by one skilled in the art.

The rotor 32 is also rotatably coupled to the magnetic core 30, whereby a second channel is defined. The channels defined by the annular rotor 32 and the annular stator 28 are substantially concentric such that a single channel 36 represents the individual channels.

In the Claims:

Please cancel claims 6-8 and 14-16.

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